

**1 Title : STRAP TIE HOLDER**

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**BACKGROUND**

5 This invention relates to a connection securing a strap connector to a support member. In particular, the holder of the present invention is designed to quickly and inexpensively permit temporary connection of strap tie holdowns to formboards during the pouring of concrete foundations.

Earthquakes, hurricanes, tornadoes, and floods impose forces on a  
10 building that can cause structural failure. To counteract these forces, it has become common practice to strengthen or add ties between the structural members of a building in areas where such cataclysmic forces can occur.

One of the most critical connections that should be made is between the support walls of a building and its foundation. In such an application, the  
15 connector or anchoring member embedded in the concrete foundation will often be placed near the side surface of the foundation. This is because the support walls of buildings are often built at the edges of the foundation. When an embedded anchor or connector is located near the side surface of a foundation, it is important that the concrete form a continuous member  
20 between the connector and the side surface to protect the connector from the elements and to maximize the concrete's hold on the embedded connector. Strap tie holdown connectors are designed to run along the outside of the shear wall, rather than through it as connectors that use anchor bolts do. Because shear walls are generally located with their outer  
25 side surface generally in line with the outer side surface of the stem wall foundation, the strap tie holdown connector, ideally, should protrude from the foundation at the interface of the outer side surface and upper surface of the foundation.

All holdowns must be suspended in place before the concrete  
30 foundations in which they are to be embedded are poured, but in the case of strap tie holdowns it is especially critical that the placement be as accurate as possible. In the prior art, strap tie holdowns have simply been nailed to the formboards. Alternatively, devices have been clipped to the formboard that allow fasteners to be passed through both the device and the strap tie  
35 holdown, thereby hanging the strap tie holdown in place. Such devices are

- 1 however limited by congruence of openings in the device and in the strap tie holdown.

#### SUMMARY OF THE INVENTION

- 5 An object of the present invention is to provide an improved means of holding strap connectors and temporarily connecting them to support members, particularly for holding strap tie holdowns and temporarily connecting them to formboards during the pouring of concrete foundations.

- A benefit of the present invention is that it can provide an adjustable  
10 connection for holding strap connectors, allowing selected strap connectors to be held in a variety of positions along their length.

A benefit of the present invention is that the strap tie connector can be, but need not be directly nailed to the formboard.

- A further benefit of the present invention is that the strap tie  
15 connector can be attached to the formboard by a holder that lies above the level of the cement foundation, such that the cementitious member is less disturbed.

#### DESCRIPTION OF THE DRAWINGS

- 20 FIG. 1 is a perspective view of a preferred embodiment of the holder of the present invention.

FIG. 2 is a top plan view of the preferred embodiment of the holder of the present invention shown in FIG. 1.

- FIG. 3 is a front elevation view of the preferred embodiment of the holder of  
25 the present invention shown in FIG. 1.

FIG. 4 is a bottom plan view of the preferred embodiment of the holder of the present invention shown in FIG. 1.

FIG. 5 is a back elevation view of the preferred embodiment of the holder of the present invention shown in FIG. 1.

- 30 FIG. 6 is a side elevation view of the preferred embodiment of the holder of the present invention shown in FIG. 1.

FIG. 7 is a perspective view of a preferred embodiment of the connection of the present invention showing the preferred embodiment of the holder of the present invention shown in FIG. 1.

- 35 FIG. 8 is a perspective view of an alternate preferred embodiment of the connection of the present invention.

- 1 FIG. 9 is a top plan view of the alternate preferred embodiment of the holder of the present invention shown in FIG. 8.
- FIG. 10 is a front elevation view of the alternate preferred embodiment of the holder of the present invention shown in FIG. 8.
- 5 FIG. 11 is a bottom plan view of the alternate preferred embodiment of the holder of the present invention shown in FIG. 8.
- FIG. 12 is a back elevation view of the alternate preferred embodiment of the holder of the present invention shown in FIG. 8.
- FIG. 13 is a side elevation view of the alternate preferred embodiment of the holder of the present invention shown in FIG. 8.
- 10 FIG. 14 is a perspective view of another alternate preferred embodiment of the holder of the present invention.
- FIG. 15 is a perspective view of a preferred embodiment of the connection of the present invention showing the preferred embodiment of the holder of the present invention shown in FIG. 1.
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#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As seen in FIG. 7 and FIG. 8, the present invention is a connection 1 comprising a support member 2, a holder 3 for compressibly holding a strap connector 4, a strap connector 4 compressibly held by the holder 3, and

20 fastener means 5 attaching the holder 3 to the support member 2.

The form of the holder 3 shown in FIG. 7 is preferably formed from a molded polymer. The form of the holder 3 shown in FIG. 8 is preferably formed from cut, punched, bent and embossed sheet metal.

Strap tie holdowns 4 are anchors that are partially embedded in a

25 cementitious member. Strap tie holdowns 4 generally consist of a flat elongated upper section 301 connected to an embedment section 302. They are preferably made from sheet metal which is punched and formed to create the strap connection. The embedment section 302 is usually formed with a hook 303 at its end, and the embedment section 302 lies at an angle to the

30 upper section 301. In a typical connection 1, the upper section 301 of the strap tie holdown 4 is preferably formed with openings 304 that receive fasteners such as nails or screws that connect the strap tie holdown 4 to a vertically disposed framing member.

In a preferred form of the present invention the support member 2 is a

35 formboard for containing a concrete foundation during pouring and setting

1 and the strap connector 4 is a strap tie holdown. Formboards can take many shapes and be made from many different materials.

Preferably, the strap connector 4 has a first face 6 and a second face 7, and the holder 3 comprises an attachment portion 8, compression means 5 9 and retaining means 10 for retaining the compression means 9 to the attachment portion 8.

Preferably, the first face 6 and the second face 7 are opposed side faces. Preferably, faces 6 and 7 are the broader faces of the strap connector 4, and the openings 304 are made in these faces 6 and 7.

10 In a preferred form of the present invention, the attachment portion 8 of the holder 3 has a first surface 11 that interfaces with the first face 6 of the strap connector 4 and the compression means 9 of the holder 3 has a second surface 12 that interfaces with the second face 7 of the strap connector 4, compressibly holding the strap connector 4.

15 As seen in FIG. 7, the attachment portion 8 of the holder 3 preferably further comprises a first portion 13 for attaching the holder 3 to the support member 2 in combination with fastener means 5, and a second portion 14 joined to the first portion 13 wherein the first surface 11 of the attachment portion 8 is located on the second portion 14.

20 As best seen in FIG. 1, the retaining means of the holder 3 preferably further comprises a third flange 15 joined to the second portion 14, a fourth flange 16 joined to the second portion 14, a fifth flange 17 joined to the third flange 15, a sixth flange 18 joined to the fourth flange 16. Although the fifth flange 17 and the sixth flange 18 are preferably separate, they can 25 converge to create a four-sided sleeve with an attachment portion 8.

Preferably, the fifth flange 17 and the second portion 14 converge toward each other, and the sixth flange 18 and the second portion 14 converge toward each other.

Preferably, the first portion 13 is a first flange and the second portion 30 14 is a second flange disposed substantially orthogonally to the first flange 13, the third flange 15 is disposed substantially orthogonally to the second flange 14, the fourth flange 16 is disposed substantially orthogonally to the second flange 14, the fifth flange 17 is disposed substantially orthogonally to the third flange 15, and the sixth flange 18 is disposed substantially 35 orthogonally to the fourth flange 16.

1 Preferably, the second flange 14 is joined to the first flange 13 at a  
first linear juncture 19, the third flange 15 is joined to the second flange 14  
at a second linear juncture 20, the fourth flange 16 is joined to the second  
flange 14 at a third linear juncture 21, the fifth flange 17 is joined to the  
5 third flange 15 at a fourth linear juncture 22, and the sixth flange 18 is  
joined to the fourth flange 16 at a fifth linear juncture 23.

In the preferred form of the present invention, the fourth linear  
juncture 22 and the second linear juncture 20 converge toward the first  
linear juncture 19, and the fifth linear juncture 23 and the third linear  
10 juncture 21 converge toward the first linear juncture 19.

Preferably, the compression means 9 of the holder 3 is a wedge  
dimensioned to closely fit within the space defined by the second, third,  
fourth, fifth and sixth linear flanges 11, 15, 16, 17 and 18.

Preferably, the wedge further comprises a tapered portion 24 having a  
15 broad end 25 and a narrow end 26 and a tab 27 joined to the tapered portion  
24 at the broad end 25.

Preferably, the tapered portion 24 of the wedge 9 further comprises a  
pair of raised guides 28 on the second surface 12 that closely fit the strap  
connector 4, and the attachment portion 8 of the holder 3 further comprises  
20 a first reference tab 29 and a second reference tab 30. Reference tabs 29  
and 30 align the first surface 11 of the holder 3 with the edge of the support  
member 2, so that the strap connector will be aligned with the edge of the  
support member 2. If the present invention is formed from a molded  
polymer, or similarly plastic material, the wedge 9 may be hollowed out in  
25 order to save material and, therefor, cost and weight.

Preferably, the attachment portion 8 of the holder 3 further comprises  
a planar gusset 31 that is perpendicular to and connects the first flange 13  
and the second flange 14.

Preferably, the first flange 13 of the attachment portion 8 further  
30 comprises fastener openings 32, and the fastener means 5 are fasteners.  
Fastener means 5 can also be a bracket, clip or clamp that interfaces with  
the support member 2. In the most preferred form of the invention, the  
fasteners 5 are 2 8d duplex nails, the duplex head allowing for easy removal,  
but the fasteners 5 may be nails, screws or tacks.

35 The connection 1 of the present invention is preferably made with this  
preferred embodiment by fixing the holder 3 to the support member 2,

1 setting the first face 6 of the strap connector 4 against the first surface 11  
of the holder 3 at the proper elevation, and inserting the compression means  
9 or wedge into the retaining means 10 and pushing downwardly on the  
compression means 9 until the compression means 9 in conjunction with the  
5 retaining means 10 and the attachment portion compressibly hold the strap  
connector 4. The foundation 300 is then poured, the foundation 300 sets,  
the compression means 9 is removed, and the holder 3 is unfixed from the  
support member 2. Vertical framing members are then erected and the strap  
connector 4 is attached to one of the vertical framing members by typical  
10 fasteners such as nails.

In an alternate preferred embodiment of the present invention, the  
holder 3 further comprises a transition portion 134 connected to said  
attachment portion 108 having a first surface 111 that interfaces with the  
first face 6 of the strap connector 4, the compression means 109 of the  
15 holder 3 has a second surface 112 that interfaces with the second face 7 of  
the strap connector 4, compressibly holding the strap connector 4 and the  
compression means 109 is a screw with a proximal end 135 and a distal end  
136 and the second surface 112 being at the distal end 136, and the  
retaining means is a retaining portion 137 attached to the transition portion  
20 134, the retaining portion 137 having a threaded opening 138 that  
threadably receives the screw 109. Preferably, the screw 109 is a thumb  
screw that can be screwed and unscrewed without tools.

Preferably, the attachment portion 108 further comprises a fastener  
portion 139 fixing the holder 3 to the support member 2 in combination with  
25 fastener means 5. Preferably, the transition portion 134 further comprises a  
first strap receiving portion 140 with a first slot 141 closely dimensioned to  
receive the strap connector 4, the first surface 111 being a side of the first  
slot 141, and a second strap receiving portion 142, with a second slot 143  
closely dimensioned to receive the strap connector 4, the first surface 111  
30 being in line with a side of the second slot 143.

Preferably, the holder 3 further comprises a fourth flange 144 joined to  
the fastener portion 139.

Preferably, the retaining portion 137 is a second flange disposed  
substantially orthogonally to the first strap receiving portion 140, the second  
35 strap receiving portion 142 is a third flange disposed substantially

1 orthogonally to the second flange 137, and the fourth flange 144 is disposed substantially orthogonally to the fastener portion 139.

Preferably, the second flange 137 is joined to the first strap receiving portion 140 at a first linear juncture 145, the first strap receiving portion 140  
5 is an extension of the attachment portion 108, the third flange 142 is joined to the second flange 137 at a second linear juncture 146, and the fourth flange 144 is joined to the fastener portion 139 at a third linear juncture 147.

Preferably, the first linear juncture 145, the second linear juncture 146  
10 and the third linear juncture 147 are reinforced with raised embossments 148, the fastener portion 139 further comprises fastener openings 149, and the fastener means 5 are fasteners. In the most preferred form of the invention, the fasteners 5 are 2 8d duplex nails, the duplex head allowing for easy removal, but the fasteners 5 may be nails, screws or tacks.

15 The connection 1 of the present invention is preferably made with this alternate preferred embodiment by fixing the holder 3 to the support member 2, sliding the strap connector 4 through the first slot 141 and the second slot 143 until the strap connector 4 is correctly positioned, and turning the thumb screw 109 to compressibly hold the strap connector 4. The  
20 foundation 300 is then poured, the foundation 300 sets, the thumb screw 109 is unscrewed, the holder 3 is unfixed from the support member 2, the holder 3 is slid off of the strap connector 4, vertical framing members are then erected and the strap connector 4 is attached to one of the vertical framing members.

25 As shown in FIG. 14, in another alternate preferred embodiment of the present invention, the attachment portion 208 further comprises a first portion 250 for attaching the holder 3 to the support member 2 in combination with fastener means 5, and a wedge 251 having a first surface 211, the wedge 251 being joined to the first portion 250. Preferably, the  
30 compression means 209 is part of a sleeve 213. The compression means 209 is a first wall 214 of the sleeve 213. The first wall 214 has a second surface 212 closely dimensioned to fit the wedge 251 such that the strap connector 4 passes through the sleeve 213 and is compressed between the first surface 211 of the wedge 251 and the second face 212 of the sleeve  
35 213. The retaining means 210 are incorporated in the sleeve 213 as side walls 215 and an opposed wall 216 from the first wall 214, all in connection

1 to the first wall 214. In this preferred embodiment, the retaining means 210  
and the compression means are incorporated in a sleeve 213 with the four  
walls shown; however, either the first wall 214 or the opposed wall 216  
could be discontinuous and consist of two separated flanges joined to the  
5 side walls 215.

The connection 1 of the present invention is preferably made with this  
alternate preferred embodiment by fixing the holder 3 to the support member  
2, sliding the sleeve 213 over the strap connector 4, positioning the strap  
connector 4, and sliding the sleeve 209 over the wedge 251 to compressibly  
10 hold the strap connector 4. The foundation 300 is then poured, the  
foundation 300 sets, the sleeve 213 is released, the holder 3 is unfixed from  
the support member 2, vertical framing members are then erected and the  
strap connector 4 is attached to one of the vertical framing members.

Although the connection formed in accordance with the present  
15 invention has been described in detail, the above description is not intended  
to limit the scope of this invention except as stated in the claims.

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